

EXHIBIT 200

REDACTED

HIGHLY CONFIDENTIAL

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS**

STATE OF TEXAS et al.,
Plaintiffs

vs.

GOOGLE LLC,
Defendant

Case Number 4:20-cv-00957

EXPERT REBUTTAL REPORT OF DAVID W. DERAMUS, PH.D.

September 9, 2024

HIGHLY CONFIDENTIAL

II.A. Alternative approaches to determining monetary remedies

- (21) There are various approaches to determining monetary remedies in a litigation context, depending on the statute, the plaintiff, the defendants, and the claimed harm. One approach may be to calculate the benefits obtained by the defendant as a result of the conduct, such as in a plaintiff's claim for the disgorgement of a defendant's profits resulting from the infringement of the plaintiff's patents. In other contexts, a plaintiff may seek recovery of their monetary damages. In a price-fixing case, for example, a plaintiff purchaser may have paid prices for a particular input that were elevated by the price-fixing agreement; thus, an appropriate measure of damages may be calculated by first estimating the price that the plaintiff would have paid "but for" the alleged conduct, and then calculating the plaintiff's damages based on the amount of the price differential multiplied by the plaintiff's volume of purchases. In yet other contexts, a plaintiff may seek to recover the profits that they would have earned, or the lost value of their business, as a result of the defendant's conduct at issue, such as in the event of conduct that forced a plaintiff competitor to exit a relevant market and allowed the defendant to monopolize it. In yet other instances, such as in a contract-related dispute, a plaintiff may seek monetary relief based on the full rescission of the contract, with a complete repayment of all revenues paid by the plaintiff or monies received by the defendant.²²
- (22) Note that a defendant's benefit (e.g., the incremental profit earned by a chemical company from making a product) may not equal the harm to the plaintiff (e.g., the disruption to a purchaser's business if a chemical was defective) or to other parties (e.g., the physical harm to consumers exposed to a toxic chemical spill). Certain statutes may also allow for the recovery of a multiple of damages, such as treble damages in the case of certain antitrust violations, or punitive damages in other contexts.²³ It is my understanding that the purpose of treble damages in the antitrust context, and to a certain extent punitive damages, is to deter the conduct at issue, both with regard to the defendant and other parties.²⁴

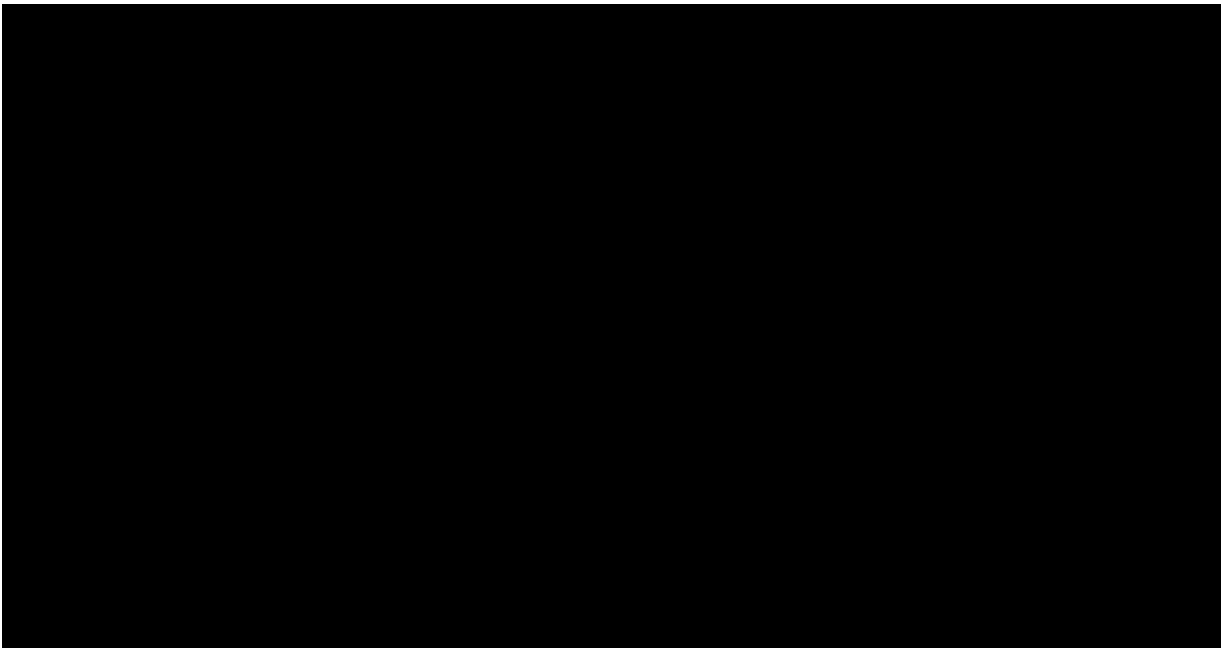
²² For a general review of alternative approaches for calculating monetary remedies, see, e.g., Roman Weil, Daniel Lentz, and David Hoffman (eds.), *Litigation Services Handbook: Role of the Financial Expert*, John Wiley & Sons, Inc., 2012, Fifth Ed.; Hoboken, NJ, pp. 4.11 – 4.21.

²³ See, e.g., Indiana Code § 24-5-0.5-4 (2023), which states that the court "may increase damages for a willful deceptive act in an amount that does not exceed the greater of: (1) three (3) times the actual damages of the consumer suffering the loss; or (2) one thousand dollars (\$1000)," in an action brought by "a person relying upon an uncured or incurable deceptive act;" Nevada Rev State § 598.0971 (2023), which permits the imposition of "an administrative fine of \$1,000 or treble the amount of restitution ordered, whichever is greater;" North Dakota Century Code § 51-15-09 (2023), which states that "if the court finds the defendant knowingly committed the conduct, the court may order that the person commencing the action recover up to three times the actual damages proven;" South Carolina Code § 39-5-50 (2023), which states that the court "shall award three times the actual damages sustained" in an action brought "individually" by "any person who suffers any ascertainable loss of money or property... as a result of the use... of an unfair or deceptive method;" and Texas Code § 17.50 (2023), which similarly provides for treble damages for "mental anguish." See also 15 U.S.C. § 15 (2023) and 18 U.S.C. (1964) for examples of federal laws allowing for treble damages.

²⁴ See, e.g., Steven C. Salop & Lawrence J. White, *Economic Analysis of Private Antitrust Litigation*, 74 GEO. L.J. 1001, 1051 (1986). The Supreme Court noted that the fear of treble damages creates "a crucial deterrent to potential violators." (*Mitsubishi Motors Corp. v. Soler Chrysler-Plymouth, Inc.*, 473 U.S. 614, 635).

total amount of revenue paid to Google by advertisers. After accounting for traffic acquisition costs (“TAC”) and content acquisition costs (“CAC”), the potentially affected products generated total net revenue of [REDACTED] for Google over these years. With regard to the profitability of Google’s Ad Tech business, I consider two alternative measures of profits: gross profit (which is net revenues less cost of goods sold); and operating profit (which is gross profit less other operating expenses, including sales, marketing, and general administrative expenses).¹²⁴ Gross profit can often be used to assess the incremental profits contributed by certain conduct, if that conduct leads to incremental revenue (e.g., by raising prices or diverting sales from a competitor) without also increasing the operating costs (e.g., without requiring additional marketing and sales efforts to obtain those higher prices or to compete for those additional sales from a competitor). From December 2013 to 2023, for its DVAA business, Google recorded total gross profit of [REDACTED] and total operating profit of [REDACTED].

Figure 5: Google DVAA P&L



Source: Andrien Report backup for Exhibit 2 (2013–2021). Skinner Report backup for Table 4B (2022–2023).

Notes: [1] Includes AdSense for Content, AdX, Doubleclick Bid Manager, AdMob, Doubleclick for Publishers, AdServing, Ad Manager, AwBid, Display & Video 360, Campaign Manager, and Google Ads.

[2] Since the earliest start date for a DTPA claim is November 11, 2013 for Bernanke, [REDACTED]

(74) Dr. Wiggins and Dr. Skinner assume that only three products were affected by Google’s conduct at issue: AdX, Google Ads, and DV360.¹²⁵ However, as discussed above, they do not explain why

¹²⁴ See Andrien Report, Exhibit 2.

¹²⁵ Dr. Wiggins includes only Google’s revenues from AdX, Google Ads, and DV360 in his calculation of Google’s per-transaction revenue, which is then used as an input to his per-violation penalty estimate. Wiggins Report, Table 2.

Google's revenues and profits associated with Ad Tech products would not have been affected, since they are integrated into the same digital advertising ecosystem. The excluded products—AdMob, AdSense, and CM360—account for [REDACTED] of net revenue, [REDACTED] of gross profit, and [REDACTED] of operating profit for Google Display Advertising in [REDACTED].¹²⁶ A 2019 Google document regarding the DVAA P&Ls describes the "DVAA product suite" as "a result of acquisitions to play across the entire marketer-to-publisher chain."¹²⁷ The same document also clarifies the linkages between the three products excluded by Dr. Wiggins and Dr. Skinner and the rest of the DVAA ecosystem.¹²⁸

- (75) Moreover, the scope of the affected volume of commerce by the conduct at issue could be much greater than Google's Ad Tech revenues described above. There are some types of products, and some types of conduct, for which it is straightforward to identify the volume of commerce affected by that conduct. For example, if a company CEO fraudulently misrepresents its financial performance in order to increase the company's stock price, the commerce affected by that fraud is likely limited to the trading of that company's stock, not the stock of other companies; or if a producer of a lamp contends that it tested the lamps to comply with a given standard (e.g., the UL standard), but it had not, then the affected volume of commerce is likely limited to the revenues from the sale of the lamps at issue. Here, however, the task is more complicated because of the interconnected nature of the products and markets. Since the core product at issue, AdX, is at the intersection of many different products and technologies, and it is the software that executes transactions that flow through other products (from which Google also generates profits), the volume of affected commerce is likely to be considerably greater than simply the amount of AdX booked revenue, and likely includes revenues from other Google Ad Tech products, as calculated above. Furthermore, given the integration of Google's Ad Tech products into both its Ad Tech business serving third-party publishers and its sales of advertising on its own properties, as discussed above, the volume of affected commerce may extend beyond the Ad Tech revenues to also encompass Google's advertising on its own properties, such as YouTube, Gmail, or Search.
- (76) Figure 6 compares the booked revenue of Ad Tech products with Google's advertising revenue by segment reported in its 10-K filings. Booked revenues from Google Network Members' properties provide a useful measure for the volume of commerce likely affected directly by the conduct at issue, because they consist primarily of advertising revenues generated from ads placed on Google Network Members' properties through AdMob, AdSense, and Google Ad Manager (DoubleClick AdExchange

Similarly, Dr. Skinner argues that these three products are the "at-issue DVAA products." Skinner Report, ¶ 50 and Table 3.

¹²⁶ See my backup materials for details.

¹²⁷ GOOG-AT-MDL-001057220, at -7247.

¹²⁸ See, e.g., GOOG-AT-MDL-001057220, at -7248 ("Advertiser uses DoubleClick Campaign Manager (DCM) to manage spend across multiple DSPs. Some of that money might then use DoubleClick Bid Manager (DBM) [now part of DV360] to purchase inventory via Ad Exchange (AdX) to buy an ad slot managed by DoubleClick for Publishers (in which case it can be purchased via Ad Exchange or by another Network/SSP).")

Figure 15: Deterrent penalties based on present value of incremental profit with “Beyond Bernanke” profit margin, Bernanke in isolation (2013 and 2025 dollars)

Category	Scenario	Incremental profit	Profit-based deterrent penalty, using probability of detection:		
			33%	20%	10%
Incremental Profit as of 2013					
Incremental Profit as of June 2025					

Source: Bloomberg, GOOG-DOJ-28385887 at -5895, Andrien Report backup for Exhibit 2 (2013–2021). Skinner Report backup for Table 4B (2022–2023).

Notes: I calculate incremental profit as the product of the incremental annual revenue amount and the profit margin estimate calculated from the “Beyond Bernanke” results presentation. My calculation of gross profit margin reflects AdSense for Content, AdX, Doubleclick Bid Manager, AdMob, Doubleclick for Publishers, AdServing, Ad Manager, AwBid, Display & Video 360, Campaign Manager, and Google Ads.

- (115) To provide context for these numbers, recall that Dr. Wiggins claims that he “estimated the incremental profits that Google would have earned due to the alleged deception about RPO, DRS v1, DRS v2, and Bernanke to be [REDACTED]”²⁰⁵ And Dr. Wiggins goes further in arguing that none of the deceptive programs generated incremental profits for Google.²⁰⁶ Meanwhile, the Google-internal estimate (before the start of this litigation) is that in a single year, the incremental profit that Google earned as a result of the Bernanke program alone is approximately [REDACTED]²⁰⁷

VI.D.3. Deterrent penalties based on expected *ex ante* combined value of Bernanke, DRS, and RPO programs

- (116) The above calculations do not take into account the additional expected benefits of the DRS and RPO programs. Accordingly, I further examine the impact on the above calculations of the deterrent penalty amount by incorporating the incremental revenues and profits expected from these programs. In estimating the expected benefits from the three programs collectively, even though the alleged conduct started at different times for the different programs, for ease of presentation, I first calculate the present value as of the end of 2013 and then bring the expected benefits forward to June 2025.²⁰⁸
- (117) Figure 16 shows that the present value of the expected revenues of the DRS, RPO, and Bernanke programs ranges from [REDACTED] to [REDACTED] in 2013 dollars and from [REDACTED] to [REDACTED] in 2025 dollars. The incremental profit figures increase to between [REDACTED] and [REDACTED]

²⁰⁵ Wiggins Report, ¶ 257.

²⁰⁶ Wiggins Report, ¶ 19.

²⁰⁷ Approximately [REDACTED] in annual revenue at profit rate of around [REDACTED] implies incremental profits of around [REDACTED] in a single year.

²⁰⁸ The RPO and DRS programs started in 2015 and the Bernanke program in 2013. See Andrien Report, ¶ 11.d. I use the 2014 WACC for the present value calculations of benefits from the RPO and DRS programs, and the 2013 WACC for those from the Bernanke program.

Figure 16: Deterrent penalties based on present value of incremental benefit across Bernanke, DRS, and RPO combined (2013 and 2025 dollars)

Category	Scenario	Incremental revenue	Incremental profit	Profit-based deterrent penalty, using probability of detection:		
				33%	20%	10%
Incremental benefit as of 2013						
Incremental benefit as of June 2025						

Source: Bloomberg, GOOG-DOJ-28385887 at -5895, GOOG-A-MDL-B-001114919, GOOG-DOJ-32280412 at -0447, Andrien Report backup for Exhibit 2 (2013–2021). Skinner Report backup for Table 4B (2022–2023).

Notes: I calculate incremental profit as the product of each incremental annual revenue amount across the three programs and Google DVAA's gross profit margin in the 2013-2023 period. My calculation of gross profit margin reflects AdSense for Content, AdX, Doubleclick Bid Manager, AdMob, Doubleclick for Publishers, AdServing, Ad Manager, AwBid, Display & Video 360, Campaign Manager, and Google Ads.

- (118) My analysis above focuses on the incremental benefits of the Bernanke, DRS, and RPO programs, which constitute a subset of the programs at issue in this matter. For example, my calculations do not consider the benefits Google derived from Dynamic Allocation and Enhanced Dynamic Allocation, which I understand led to higher win rates, and consequently higher revenue, for AdX while conversely lowering the win rates and revenue for non-Google exchanges.²⁰⁹ The values I present in Figure 16 would likely be larger had I considered the benefits from other Google programs.

VI.D.4. Deterrent penalties if *ex ante* expected benefits limited to 20 years

- (119) I have seen no information in the documents to indicate that Google expected the benefits from the programs at issue to be limited in time. Nonetheless, I evaluate the impact on the above calculations, if I were to assume that Google expected the benefits from these programs to only last for 20 years.
- (120) For brevity, I examine the impact on the lowest and highest of the above scenarios, i.e.: (i.) the first scenario above, limited to the benefits from Bernanke alone, using the DVAA profit margin, and assuming a 3% annual growth rate; and (ii.) the last scenario, which includes the benefits from the three programs at issue, and using a 5% annual growth rate. The results are shown in Figure 17, with the range of deterrent penalties ranging from \$ [REDACTED] to [REDACTED] in 2025 dollars.

²⁰⁹ Weinberg Report, ¶ 12.a.

remaining highly profitable, and in fact, becoming significantly more profitable and with its stock price continuing to rise considerably (its current stock price is more than 349% higher than it was in 2017 when the first of the large EU fines was assessed).²³⁵

- (133) The necessity of a substantial penalty amount is corroborated by other enforcement actions in which smaller penalties have failed to deter misconduct by similarly large and highly profitable companies. For example, on August 24, 2021, the Netherlands Authority for Consumers and Markets (“ACM”) imposed a weekly fine of €5 million on Apple for forcing dating-app developers to use Apple’s own payments service, disallowing the use of third-party services.²³⁶ Rather than cease the conduct at issue, however, Apple instead continued to violate Dutch policy and was fined each week until the accrued fine grew to be €50 million, the maximum fine stipulated by the ACM.²³⁷ Because Apple continued the conduct at issue even as the fines were accumulating, the value of the conduct to Apple appears to have been substantially greater than the €50 million fine, rendering the latter entirely insufficient as a deterrent. Apple’s total fine at issue in that proceeding, which had no impact on Apple’s conduct, was nearly three times higher than Dr. Wiggins’s proposed [REDACTED] lower bound penalty for Google in this matter.

VII.B. Market reactions to Google’s past penalties indicate that penalties below [REDACTED] are unlikely to deter similar conduct in the future

- (134) As discussed above, the appropriate deterrent penalty should consider the principal-agent problem inherent to publicly traded companies. A small penalty amount would be unlikely to impact Google’s share price, thereby offering little incentive for shareholders to monitor and deter misconduct. The penalty amount must therefore be substantial enough to have an adequate impact on the share price in order to incentivize shareholders to actively monitor and deter corporate misconduct.
- (135) To analyze the impact of previous investigations and penalties on Google’s stock price, I collect information on 48 instances where Google was subjected to a fine or settlement on account of its

²³⁵ Alphabet Inc., *Form 10-K 2023*, January 30, 2024, 34, 76.

On June 27, 2017, the day the first major EU fine was announced, Google’s stock price was \$47.4 per share. By August 23, 2024, the stock price had increased to \$165.6 per share.

²³⁶ The Netherlands Authority for Consumers and Markets, *Summary of decision on abuse of dominant position by Apple*, August 24, 2021, 21, <https://www.acm.nl/sites/default/files/documents/summary-of-decision-on-abuse-of-dominant-position-by-apple.pdf>.

²³⁷ *Ibid*; “Dutch regulator rejects Apple’s objections to fines,” *Reuters*, October 2, 2023, <https://www.reuters.com/technology/dutch-regulator-rejects-apples-objections-against-fines-2023-10-02/>.

conduct.²³⁸ These penalties range between \$25,000 and over \$9.5 billion²³⁹ prior to any subsequent reductions made by courts upon appeal by Google.²⁴⁰ I identify 18 penalties imposed in the US, 18 imposed in the EU, and 12 imposed in India, South Korea, Russia, Turkey, or Australia. For each of these 48 instances, I identify the date that the penalty was publicly announced. I am also able to identify the date on which the investigation was announced or the complaint was filed for 17 instances.²⁴¹ These 65 event days²⁴² on which the investigation or penalties were initially publicly announced span from April 2, 2008 to March 20, 2024.²⁴³ To get a sense of the magnitude of these penalties, I calculated the standard deviation of Google's daily stock returns for 2008 and 2023, which are 3.5 percent and 1.9 percent, respectively. These two years represent the first and the most recent full years during which I identified an investigation leading to a penalty. The average market capitalization of Google in these two years is \$146 billion and \$1,510 billion. Thus, the random

²³⁸ I referred to three main sources: (1) the Wiggins Report and Andrien Report, (2) regulatory agency press releases, and (3) third-party sources, including news articles reporting the event and databases such as the GDPR Enforcement tracker and the Good Jobs First Violation tracker. All sources were cross-checked with at least one other to ensure the accuracy of the information collected on the penalty. *See* CMS, "GDPR Enforcement Tracker," <https://www.enforcementtracker.com/>. *See also* Good Jobs First, "Violation Tracker," <https://violationtracker.goodjobsfirst.org/>.

²³⁹ As discussed above, on November 30, 2010, the European Commission opened an antitrust investigation into allegations that Google has abused a dominant position in online search. Subsequently, between 2017 and 2019, the European Commission imposed three fines on Google, amounting to a total of \$9.5 billion. Google was fined \$2.7 billion on June 27, 2017, for alleged self-preferencing in Google Shopping searches; \$5.1 billion on July 18, 2018, for alleged intentions to consolidate dominance in search on Android devices; and \$1.7 billion on March 20, 2019, for alleged abuse of dominance in AdSense. I sum these three penalties to approximate the severity of the 2010 investigation, which is \$9.5 billion. In addition to the initial announcement in 2010, the European Commission made a separate announcement of the investigation on Google's alleged intention to consolidate dominance in search on Android devices on April 15, 2015. There was a reduction of the \$5.1 billion fine to \$4.13 billion in 2022. I use the initial penalty in my analysis for all events. *See* European Commission, "Antitrust: Commission probes allegations of antitrust violations by Google," news release no. IP/10/1624, November 30, 2010, https://ec.europa.eu/commission/presscorner/detail/en/IP_10_1624. *See also* European Commission, "Antitrust: Commission fines Google €2.42 billion for abusing dominance as search engine by giving illegal advantage to own comparison shopping service," news release no. IP/17/1784, June 27, 2017, https://ec.europa.eu/commission/presscorner/detail/en/IP_17_1784; *See also* European Commission, "Antitrust: Commission fines Google €1.49 billion for abusive practices in online advertising," news release no. IP/19/1770, March 20, 2019, https://ec.europa.eu/commission/presscorner/detail/en/IP_19_1770; *See also* Satariano, Adam, "E.U. Scores Major Legal Victory Against Google," *New York Times*, September 14, 2022, <https://www.nytimes.com/2022/09/14/business/eu-google-antitrust-fine.html>.

²⁴⁰ For Google's prior penalties that I obtained from the Wiggins Report and Andrien Report, I used the penalty size provided by them unless the penalty had previously been announced at a larger size and later reduced by a court upon appeal by Google. In all other cases, I used the official penalty size as reported in press releases or the first news article which I could find reporting on the event. I convert the penalty to U.S. dollar using the exchange rate on the day that the penalty was publicly announced if the original penalty size was in a foreign currency.

²⁴¹ As discussed above, on November 30, 2010, the European Commission opened an antitrust investigation into allegations that Google has abused a dominant position in online search. On April 15, 2015, the European Commission announced a separate investigation into Google's illegal use of its Android mobile operating system to impose restrictions on Android device manufacturers, effectively funneling users toward the Google search engine, which appears to be a continuation of the 2010 investigation. I combine the Google stock returns on both days in my analysis.

I have not identified the date of the public announcement for some investigations because there was no public announcement until the penalty was publicly declared, or because there is no announcement available in an English-language source. This includes both official translations on the regulatory agency's website and reports from third-party sources.

²⁴² There are 48 event days of announcement of penalty and 17 event days of start of investigation.

²⁴³ See my backup materials for details.

shocks equivalent to one standard deviation change to Google's stock returns in these two years translate to a change of \$5 billion and \$29 billion in Google's market capitalization, respectively. As this comparison makes clear, the past penalties imposed on Google have been small compared to the many other factors that affect Google's share price on a daily basis.

- (136) For each of these events, I conduct an event study in which I compare Google's stock return, net of the S&P 500 return, for each of the ten trading days before and after each event day, e.g., the public announcement of the investigation or the penalty.²⁴⁴ Specifically, for each trading day surrounding the event, I calculate the return on Google's stock by determining the percentage change in the closing share price from the previous trading day. To evaluate Google's performance relative to the overall market, I subtract the S&P 500's return from Google's stock return.²⁴⁵ Additionally, to analyze the volatility of Google's adjusted stock return, I compute the standard deviation of Google's adjusted stock returns on all trading days except the event days included in the analysis.
- (137) Figure 20 below presents Google's adjusted stock returns surrounding 48 event dates when penalties were publicly announced, spanning from ten trading days before to ten trading days after each event date. The fluctuations in Google's adjusted stock returns primarily remain within one standard deviation from the average, and are mostly contained within two standard deviations.²⁴⁶ Also, there is no noticeable change in the volatility of Google's adjusted stock returns before, on, or after the event day. This consistent pattern indicates that the stock returns do not experience additional significant volatility due to the penalties announced on the event days. Therefore, the analysis indicates that these

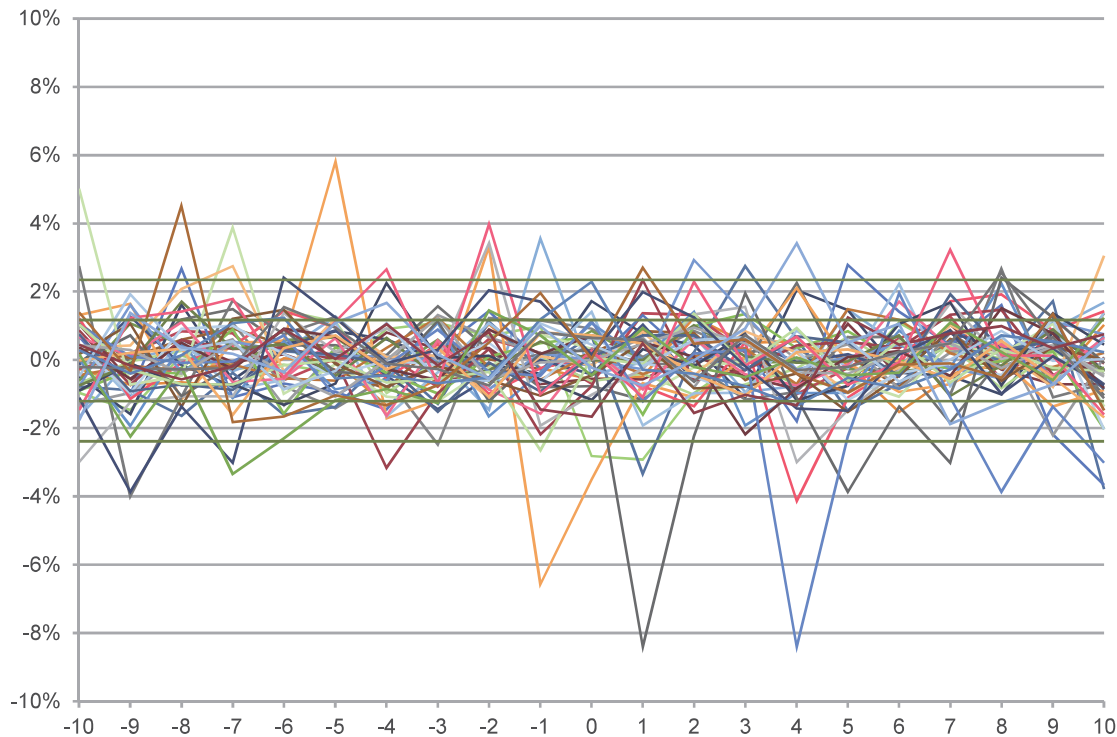
²⁴⁴ When the event day falls on a non-trading day, I adjust the event day to the closest subsequent trading day.

²⁴⁵ The S&P 500 is an index that gauges the performance of the U.S. stock market. It monitors the share prices of the 500 largest publicly traded companies in the U.S. and represents approximately 80% of the total market value of all publicly traded stocks. *See* "What Does the S&P 500 Index Measure and How Is It Calculated?" Investopedia, accessed September 6, 2024, <https://www.investopedia.com/ask/answers/040215/what-does-sp-500-index-measure-and-how-it-calculated.asp>.

²⁴⁶ The black line indicates a significant decline in Google's adjusted stock return the day following the event day. On October 25, 2022, the event day, Google announced third-quarter earnings that fell short of expectations in terms of both revenue and net income, which likely contributed to the subsequent drop in its stock value. Similarly, the light blue line indicates the same decline four trading days after the event day, which is also one day after October 25, 2022. *See* Capoot, Ashley, "Alphabet just had its worst day since March 2020, when Covid shutdowns started in the U.S.," *CNBC*, October 26, 2022, <https://www.cnbc.com/2022/10/26/alphabet-stock-falls-after-disappointing-earnings-report.html>. ("Shares of Alphabet closed down more than 9% on Wednesday in the company's worst day since March 2020 after it released third-quarter earnings Tuesday that missed on the top and bottom lines. The company reported its weakest quarter of growth since 2013 except for one other period early in the coronavirus pandemic. Revenue growth slowed to 6% from 41% a year earlier as the company contends with a continued downdraft in online ad spending."). Similarly, the orange line indicates a significant decline in Google's adjusted stock return the day before the event day. On February 8, 2023, the day before the event day, Google's new artificial intelligence technology produced a factual error in its debut demonstration, which likely contributed to the observed drop in Google's stock return on that day and the event day. *See* Olson, Emily, "Google shares drop \$100 billion after its new AI chatbot makes a mistake," *NPR*, February 9, 2023, <https://www.npr.org/2023/02/09/1155650909/google-chatbot-error-bard-shares>. ("Google's parent company, Alphabet, lost \$100 billion in market value on Wednesday after its new artificial intelligence technology produced a factual error in its first demo.").

prior penalties have had a minimal impact on Google's stock performance, providing little incentive for shareholders to actively engage in monitoring and deterring corporate misconduct.

Figure 20: Google stock return net of S&P 500 over ten trading days before and after each penalty date



Source: Bloomberg.

Note: The green dashed lines represent plus and minus one standard deviation, and plus and minus two standard deviations from the sample mean of adjusted stock returns, calculated using all trading days except for the event days included in this analysis.

- (138) Figure 21 below shows Google's stock return, net of the S&P 500 return, for the 48 days when a penalty was publicly announced. The size of each bubble corresponds to the initial penalty's magnitude. This figure indicates no evident correlation between the size of the penalties and their impact on Google's stock returns, which remains relatively consistent over time. The figure also includes one and two standard deviations from the sample average of Google's adjusted stock returns, represented by green horizontal lines. Most of Google's adjusted stock returns on these event days fall within one standard deviation, and all but two are within two standard deviations. One exception occurred on February 9, 2023, as I explained above, which coincides with an incident where Google's new artificial intelligence technology produced a factual error in its debut demonstration one day before the event day.²⁴⁷ This confounding event likely contributed to the observed drop in Google's

²⁴⁷ See Olson, Emily, "Google shares drop \$100 billion after its new AI chatbot makes a mistake," *NPR*, February 9, 2023, <https://www.npr.org/2023/02/09/1155650909/google-chatbot--error-bard-shares>. ("Google's parent company, Alphabet,

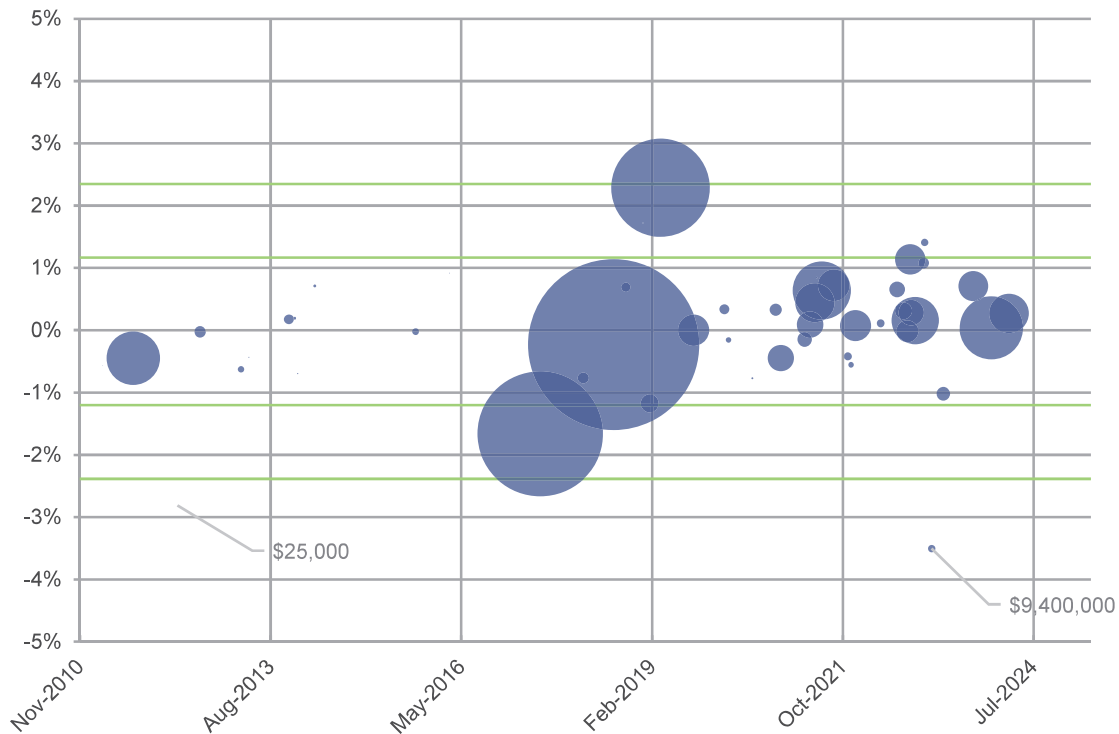
stock return on that day. Another exception occurred on April 13, 2012. One day before that, Google announced a contentious stock split that enabled the company to issue new shares without diluting the voting power of its founders.²⁴⁸ This move raised concerns among corporate governance watchdogs and frustrated some investors, contributing to the drop.²⁴⁹ Considering the very small penalty of twenty-five thousand dollars imposed on Google at that time, it is highly unlikely that the penalty itself was the primary cause of the decline. Given that the volatility of Google's adjusted stock returns predominantly fall within the normal range expected from random fluctuations, the figure indicates that these penalties have had a minimal impact on Google's stock performance, providing little incentive for shareholders to actively monitor and deter corporate misconduct.

lost \$100 billion in market value on Wednesday after its new artificial intelligence technology produced a factual error in its first demo.”).

²⁴⁸ See Richard Davies, “Google’s Stock Split Surprise,” *ABC News*, April 13, 2012, <https://abcnews.go.com/blogs/business/2012/04/googles-stock-split-surprise>.

²⁴⁹ See “Google falls on share plan,” *Financial Post*, April 13, 2012, <https://financialpost.com/news/google-falls-on-share-plan>.

Figure 21: Google stock return net of S&P 500 on the penalty days (bubble size corresponds to the amount of penalty)



Source: Bloomberg.

Note: The green lines represent plus and minus one standard deviation, and plus and minus two standard deviations from the sample mean of adjusted stock returns. The standard deviation is calculated based on the adjusted stock returns from ten trading days before and after each event excluding the event days, encompassing all events included in this analysis.

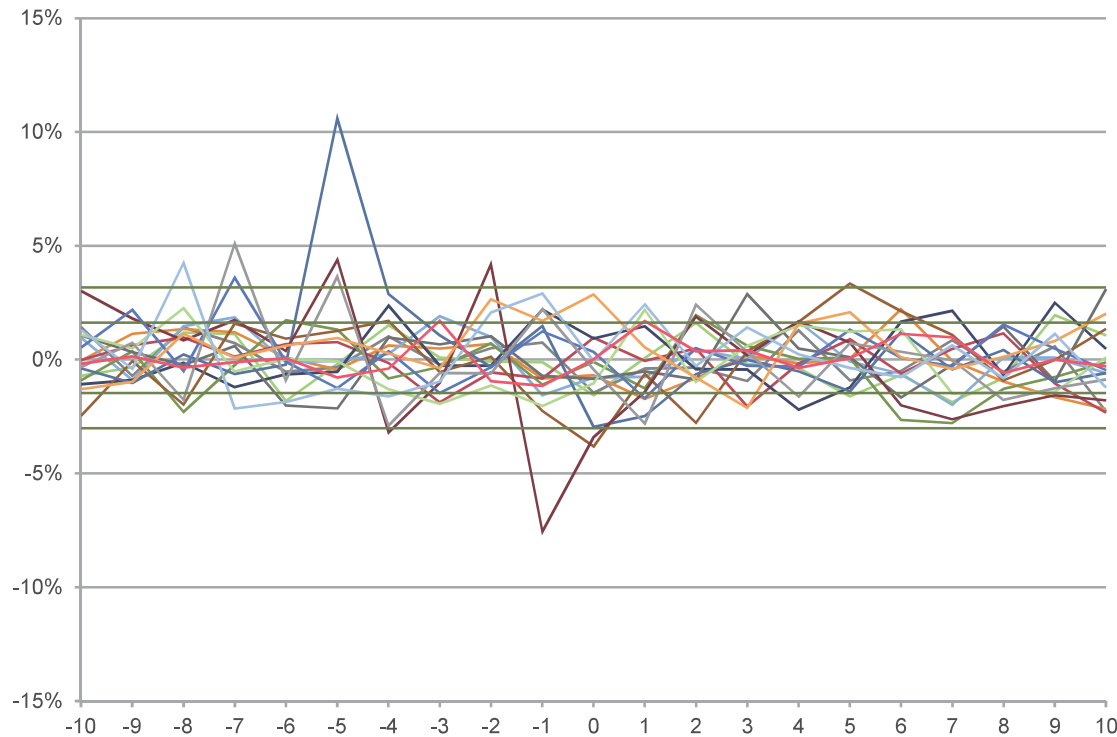
- (139) For 17 of these event studies, I was also able to identify the day when the investigation was announced (which ultimately resulted in the penalty). At that point, there may already have been a stock market response, and the full impact may be considered to be equal to the sum of the stock return when the investigation was announced and the stock return when the penalty (and other remedies) were announced. Figure 22, below, replicates the above event analysis, where the relevant event dates are now the combination of the announcements of the investigation and the penalties. Thus, I sum Google's adjusted stock returns on both days for each event.²⁵⁰ As above, the fluctuations in Google's adjusted stock returns primarily remain within one standard deviation from the average and are mostly contained within two standard deviations.²⁵¹ Also, there is no noticeable change in the

²⁵⁰ As I have explained above, there are five dates associated with the European Commission's investigation of Google Search: (1) the initial start of investigation day on November 30, 2010; (2) the follow-up announcement of investigation into Android operating system on April 15, 2015; and (3) the three dates that penalties were announced publicly on June 27, 2017, July 18, 2018, and March 20, 2019. I combine Google's adjusted stock return on these five days for this event in the analysis.

²⁵¹ The dark red line indicates a significant decline in Google's adjusted stock return the day before the event day. As I

volatility of Google's adjusted stock returns before, on, or after the event day. This consistent pattern indicates that the stock returns do not experience significant additional volatility due to the penalties announced on the event days.

Figure 22: Google combined stock return net of S&P 500 on both the start of investigation date and penalty date over ten trading days before and after the event date for eligible lawsuits



Source: Bloomberg.

Note: The green dashed lines represent plus and minus one standard deviation, and plus and minus two standard deviations from the sample mean of combined adjusted stock returns, calculated using all trading days except for the event days included in this analysis.

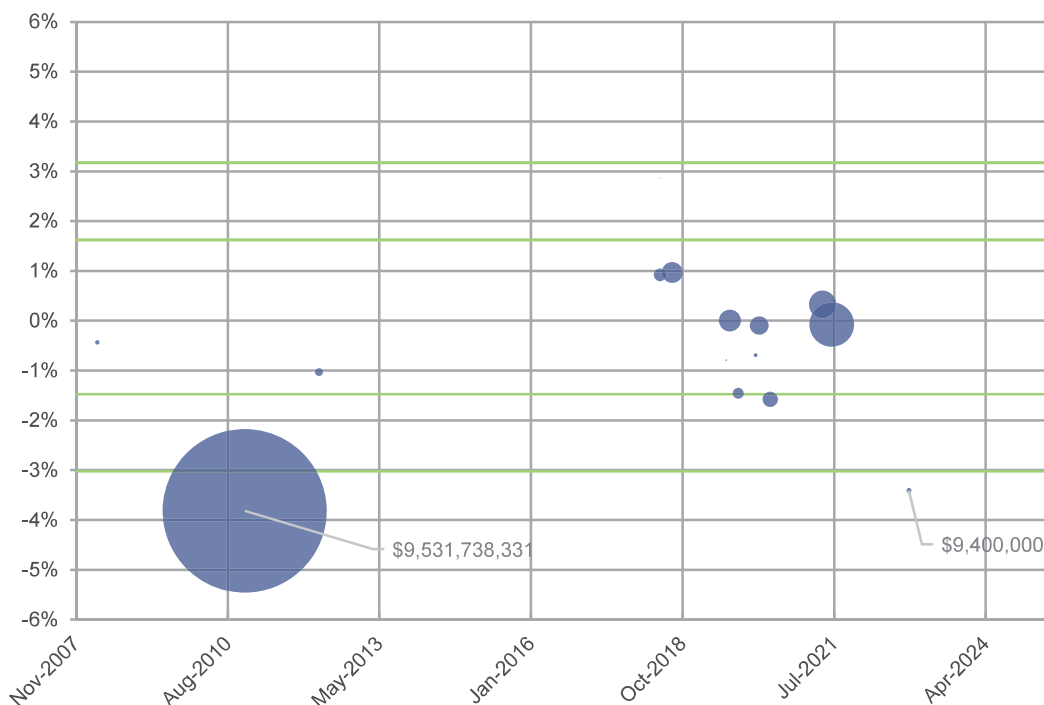
- (140) Similarly, I have replicated the bubble chart analysis above with Google's combined adjusted stock returns on the 17 events that include both the start of investigation date and penalty date.²⁵² Figure 23, below, shows that the combined adjusted stock returns for nearly all events are of modest magnitude, remaining within one standard deviation of typical daily fluctuations. The one noticeable exception is

explained above, on February 8, 2023, the day before the event day, Google's new artificial intelligence technology produced a factual error in its debut demonstration, which likely contributed to the observed drop in Google's stock return on that day and the event day. *See* Olson, Emily, "Google shares drop \$100 billion after its new AI chatbot makes a mistake," *NPR*, February 9, 2023, <https://www.npr.org/2023/02/09/1155650909/google-chatbot--error-bard-shares>. ("Google's parent company, Alphabet, lost \$100 billion in market value on Wednesday after its new artificial intelligence technology produced a factual error in its first demo.").

²⁵² As explained above, I combine Google's adjusted stock returns on the five days associated with the European Commission's investigation into Google search announced in late 2010.

the European Commission's investigation of Google Search announced in late 2010, which led to a total penalty of \$9.5 billion. The combined adjusted return of the five associated event dates is -3.8%. In particular, on November 30, 2010—the day the initial investigation into allegations that Google has abused a dominant position in online search was announced—Google's adjusted stock return dropped by 3.9%, marking a highly unusual deviation.²⁵³ Several news articles at the time linked this significant drop to the European Commission's announcement of the investigation.²⁵⁴ The other outlier in the bottom right of the figure is likely due to the factual error made in the debut demonstration of Google's AI product, as discussed above.

Figure 23: Google combined stock return net of S&P 500 on both start of investigation date and penalty date (date corresponds to the start of investigation; bubble size corresponds to the amount of penalty)



Source: Bloomberg.

Note: The green lines represent plus and minus one standard deviation, and plus and minus two standard deviations from the sample mean of combined adjusted stock returns. The standard deviation is calculated based on the combined adjusted stock returns from ten trading days before and after each event excluding event days, encompassing all events.

²⁵³ Out of the 504 trading days in 2010 and 2011, there are only three trading days with a lower adjusted return than November 30, 2010. See my backup materials for details.

²⁵⁴ See Pepitone, Julianne, "Stocks end November with a whimper," *CNN Money*, November 30, 2010, https://money.cnn.com/2010/11/30/markets/markets_newyork/index.htm. ("Google's (GOOG, Fortune 500) stock ended down more than 4.5% after the European Commission said it will investigate whether the Internet search company violated antitrust rules."). See also Jordans, Frank, "Tagged in a photo without consent? Europe watchdogs take up fight; regulators' probes set the stage for battle with Facebook, Google over protecting users' rights," *Mercury News*, March 25, 2010, <https://www.mercurynews.com/2010/11/30/european-authorities-investigating-whether-google-gave-its-services-search-preference/>. See also "EU sets up antitrust probe of how Google works," *Pioneer Press*, November 12, 2015, <https://www.twincities.com/2010/11/30/eu-sets-up-antitrust-probe-of-how-google-works/>.

- (141) These results indicate that, with the exception of EC investigation that resulted in penalties of \$9.5 billion (and associated remedies),²⁵⁵ none of the other penalties (and associated remedies) were large enough to impact Google's stock market prices more so than any of the other multitude of factors that lead to the daily fluctuations in Google's share price. The conclusion I draw is not that there are no stock market responses to these penalties (and associated remedies), but rather that if there are such responses, they are so small that they are indistinguishable from all the other factors that result in movements in Google's share price and thus unlikely to induce shareholders to force managers to change their future conduct. When the European Commission first announced the investigation, it introduced significant uncertainty into the market regarding Google's future operations in Europe. Investors, concerned about potential fines, restrictions, and the impact on Google's European business, may have reacted negatively, leading to a drop in stock price. By the time the European Commission announced the actual penalty, the market may have already priced in the anticipated outcomes of the investigation. This means investors had enough time to evaluate the potential risks and adjust their positions accordingly. As a result, the actual penalty announcement may not have had a significant additional impact simply because the expected information was already reflected in the stock price. Thus, the size of the total penalties is a reasonable proxy of the severity of the investigation when it was initially announced.
- (142) Considering that the penalties were imposed in 2017, 2018, and 2019, and given the significant increase in Google's market capitalization since then, I have calculated the equivalent total penalty that could have a similar impact on Google's stock return as the initial announcement of the investigation by the European Commission in late 2010 for 2025 using various methods.
- (143) First, I compute the inflation-adjusted penalty imposed by the European Commission by using the projected inflation rates for each year from when the penalty was announced until June 2025, the earliest date on which I assume a penalty would be imposed on Google in this case.²⁵⁶ Thus, as of June 2025, a deterrent penalty imposed in this matter would need to be at least [REDACTED] to be consistent with the total inflation-adjusted value of the penalty previously imposed by the European Commission, which is a value that may have at least some measurable impact on Google's stock price.²⁵⁷

²⁵⁵ For example, the European Commission has placed injunctions against illegal restrictions on Android device manufacturers and mobile operators. It has also placed injunctions against self-preferencing own comparison shopping service in search results. *See* European Commission, "Antitrust: Commission fines Google €4.34 billion for abuse of dominance regarding Android devices," news release, July 18, 2018, https://ec.europa.eu/commission/presscorner/detail/en/IP_18_4581.

²⁵⁶ The (projected) inflation rates in the U.S. are downloaded from Statista. *See* "Projected annual inflation rate in the United States from 2010 to 2029," Statista, April 2024, <https://www.statista.com/statistics/244983/projected-inflation-rate-in-the-united-states/>.

²⁵⁷ See my backup materials for details.

- (144) I note, however, that this [REDACTED] value likely underestimates the size of the penalty required to have an impact on Google's stock price, given the rapid continued growth in Google's stock price since the time the European Commission penalty was announced. I address this in two alternative ways. First, I calculate the penalty by multiplying Google's WACC for each year from when the European Commission penalty was announced until June 2025. I use Google's WACC in 2024 as an approximation of its WACC in 2025. This results in a WACC-adjusted penalty value as of June 2025 of [REDACTED].²⁵⁸
- (145) Second, I recalibrate each of the European Commission penalties based on the ratio of Google's market capitalization on August 29, 2024, the most recent day with available market capitalization data, to its market capitalization on the dates when each penalty was initially announced. I expect that the impact of a given penalty on a company's stock price depends on the company's total market capitalization; as Google's market capitalization has grown substantially since the imposition of the European Commission's penalties, it is thus reasonable to scale that penalty to be consistent with Google's current market capitalization. Using this adjustment suggests that a penalty of [REDACTED] would be needed to have the same relative impact on Google's stock price as the prior European Commission penalties of \$9.5 billion.²⁵⁹
- (146) Thus, I conclude that penalties of between [REDACTED] and [REDACTED], and likely even higher as explained above, would likely be necessary to create a sufficient impact on Google's stock price to ensure that shareholders, not only of Google but also of other similarly situated companies, deter management from engaging in such conduct in the future.

VIII. Penalties of [REDACTED] would not impair or disrupt Google's finances or operations

- (147) In his report, Dr. Wiggins claims that "measures of Google's overall financial performance are not relevant for assessing penalties related to the alleged deception."²⁶⁰ Dr. Skinner similarly questions the relevance of Mr. Andrien's analysis of the financial performance of Alphabet and of Google's advertising business.²⁶¹ Dr. Skinner also takes issue with Mr. Andrien's conclusion that a hypothetical [REDACTED] penalty imposed on Google "would not be so burdensome as to impact the day-to-day

²⁵⁸ See my backup materials for details.

²⁵⁹ See my backup materials for details.

²⁶⁰ Wiggins Report, § VIII.B.

²⁶¹ Skinner Report, ¶ 59 and § IX; It makes no difference whether the analysis is of Google or Alphabet because in 2023 Google accounted for 99% of Alphabet's revenue and over 100% of its profits as other revenue streams operate at a loss. S&P Capital IQ. See my backup materials for details.

HIGHLY CONFIDENTIAL - Expert Report of David W. DeRamus, Ph.D.

A handwritten signature in black ink, appearing to read 'D. DeRamus', is positioned above a horizontal line.

David W. DeRamus, Ph.D.

September 9, 2024

Date